

Borehole

51-17-03

Log Event A

Borehole Information

Farm : <u>TX</u>	Tank : <u>TX-117</u>	Site Number : <u>299-W15-68</u>
N-Coord : <u>42,098</u>	W-Coord : <u>75,801</u>	TOC Elevation : <u>672.61</u>
Water Level, ft :	Date Drilled : <u>1/31/1949</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness, in. : <u>0.313</u>	ID, in. : <u>8</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>144</u>	

Borehole Notes:

According to the driller's log, this borehole was perforated but not grouted. The driller's log records perforations along a 54-ft interval; however, the driller's log does not indicate at what depths the casing was perforated. Hanford Wells (PNL-8800) identifies the perforated interval from 38 to 92 ft. Total logging depth achieved by the SGLS was 142.5 ft. The casing thickness is presumed to be 0.322 in., on the basis of published thickness for schedule-40, 8-in. steel tubing. The zero reference for the SGLS log is the top of the borehole casing, which is flush with the ground surface.

Equipment Information

Logging System : <u>2</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>10/1995</u>	Calibration Reference : <u>GJPO-HAN-3</u>	Logging Procedure : <u>P-GJPO-1783</u>

Log Run Information

Log Run Number : <u>1</u>	Log Run Date : <u>1/17/1996</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>142.5</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>55.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>2</u>	Log Run Date : <u>1/18/1996</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>0.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>48.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>3</u>	Log Run Date : <u>1/19/1996</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>142.5</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>80.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

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Log Run Number :	<u>4</u>	Log Run Date :	<u>1/22/1996</u>	Logging Engineer:	<u>Alan Pearson</u>
Start Depth, ft.:	<u>81.0</u>	Counting Time, sec.:	<u>100</u>	L/R : <u>L</u>	Shield : <u>N</u>
Finish Depth, ft. :	<u>47.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

Log Run Number :	<u>5</u>	Log Run Date :	<u>1/22/1996</u>	Logging Engineer:	<u>Alan Pearson</u>
Start Depth, ft.:	<u>16.0</u>	Counting Time, sec.:	<u>100</u>	L/R : <u>L</u>	Shield : <u>N</u>
Finish Depth, ft. :	<u>0.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

Analysis Information

Analyst : S.D. BarryData Processing Reference : P-GJPO-1787Analysis Date : 1/8/1997

Analysis Notes :

This borehole was logged in five log runs. Data from the first log run had to be discarded because many of the files had become corrupted. Three of the logging runs were required to complete the log of the borehole. A fifth logging run from 0 to 16 ft served as a rerun of a segment of the log as a quality assurance check. Data from the log segment acquired during the first log run were lost as the result of computer failure. This log segment was relogged during subsequent log runs.

The pre- and post-survey field verification spectra met the acceptance criteria established for the peak shape and detector efficiency, confirming that the SGLS was operating within specifications. The energy calibration and peak-shape calibration from these spectra were used to establish the channel-to-energy parameters used in processing the spectra acquired during the logging operation.

A correction for 0.322-in.-thick casing had not been determined, so the casing correction for 0.330-in.-thick casing was applied to the data. This correction factor will cause the calculated concentration values to be slightly higher than the actual concentrations.

The only man-made radionuclide detected in this borehole was Cs-137. The presence of Cs-137 contamination was measured almost continuously from the ground surface to about 99 ft, intermittently from 99 to 122 ft, and continuously from 135 to 142.5 ft (total depth logged). The maximum Cs-137 concentration was 111.9 pCi/g at 1 ft.

K-40 concentrations increase at about 48 ft. At 96 ft, the Th-232 and U-238 concentrations increase. The K-40 and Th-232 plots show a region of decreased concentration values between 102 and 120 ft. Between 115 and 119 ft, the U-238 plot shows a region of elevated concentration values. There is a measurable decrease in the K-40 and Th-232 concentration values from 132 ft to the bottom of the borehole.

Between the ground surface and a depth of 2.5 ft, it was not possible to identify the 609-keV peaks used to determine the U-238 concentrations. This occurred because high gamma-ray activity associated with the nearby Cs-137 peak (661 keV) created an elevated Compton continuum extending to the 609-keV region that caused the MDL to exceed the measured U-238 concentration.



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Additional information and interpretations of log data are included in the main body of the Tank Summary Data Reports for tanks TX-116 and TX-117.

Log Plot Notes:

Separate log plots show the man-made (Cs-137) and the naturally occurring radionuclides (KUT). The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

A rerun plot was generated for the region between 0 and 16 ft. The radionuclide concentrations were calculated using the separate data sets provided by the original and rerun logging runs.